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Group Art Unit: 2813

AMENDMENTS TO CLAIMS

- Please amend pending claims 30-32, 36, 37, and 41-45 as indicated below. A complete listing of all claims and their status in the application are as follows:

Claims 1-29 (canceled)

30. (currently amended) A structure for a torch bump, comprising:
a substrate, ~~said substrate~~ having been provided with a contact pad over the surface
~~thereof, thereof;~~

~~a patterned and etched layer of passivation having been deposited over the surface of~~
~~the substrate, and exposing the surface of said contact pad; pad;~~

~~a layer of UBM having been blanket deposited over the surface of the layer of~~
~~passivation including the exposed surface of the contact pad; and~~

~~a base of said torch bump having been created overlying said contact pad using a~~
~~patterned and developed first layer of dry film as a mask and having a flat top~~
~~area;~~

~~a layer of solder of said torch bump base having said torch bump bonded to the flat top~~
~~area at been created overlying said base using a patterned and developed~~
~~second layer of dry film as a mask;~~

~~said patterned and developed first and second layers of dry film having been removed;~~
~~and~~

~~reflow having been applied to said layer of solder; a flat bottom area of said torch~~
~~bump, said flat top area larger than the flat bottom area.~~

31. (currently amended) The structure of claim 30, said base of said torch bump
~~having been created comprising; further comprising a first layer, a second layer on the first~~
~~layer, and a third layer on the second layer.~~

~~a first layer of dry film having been deposited over the surface of said layer of UBM;~~
~~said first layer of dry film having been patterned and developed, having created an~~
~~opening through said first layer of dry that aligns with said contact pad, having~~
~~created a first mask of dry film, exposing said layer of UBM; and~~

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~~successive layers of metal having been deposited over the exposed surface of said layer of UBM in accordance with the opening created through said first mask of dry film.~~

32. (currently amended) The structure of ~~claim 31~~ claim 30, said ~~successive layers of metal base of said torch bump further comprising:~~

a first layer of copper having been deposited over the exposed surface of said layer of UBM;

a second layer of nickel having been deposited over said first layer of copper; and

a third layer of gold having been deposited over the surface of said second layer of nickel.

33. (original) The structure of claim 32, said first layer of copper having been deposited to a thickness of about 90 μm .

34. (original) The structure of claim 32, said second layer of nickel being deposited to a thickness of about 5 μm .

35. (original) The structure of claim 32, said third layer of gold having been deposited to a thickness of about 5 μm .

36. (currently amended) The structure of ~~claim 30, said layer of solder having been created by:~~ claim 31, wherein the top of the first layer is flat.

~~a second layer of dry film having been deposited over the surface of said first layer of dry film, thereby including the surface of said base;~~

~~said second layer of dry film having been patterned and developed, having created an opening through said second layer of dry that aligns with said base of said torch bump, having created a second mask of dry film, having exposed said base of said torch bump; and~~

~~a layer of solder having been developed in accordance with the opening created through said second mask of dry film.~~

37. (currently amended) The structure of ~~claim 31, said successive layers of metal comprising:~~ 30, said base of said torch bump further comprising:

a first layer of solder having been deposited over the exposed surface of said layer of UBM; and

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a second layer of eutectic solder paste having been deposited over said first layer of solder.

38. (original) The structure of claim 37, whereby additionally a layer of nickel having been deposited over the surface of said first layer of solder after which a layer of gold having been deposited over the surface of said layer of nickel after which said second layer of eutectic solder paste having been deposited over the surface of said layer of gold.

39. (original) The structure of claim 30, said layer of UBM comprising nickel.

40. (original) The structure of claim 39, said nickel having been deposited to a thickness between about 1 and 10 μm .

41. (currently amended) The structure of claim 30, additionally said layer of UBM having been ~~etched~~ etched using said created base of said torch bump and said created layer of solder as a mask.

42. (currently amended) The structure of claim ~~41~~, ~~said etching said layer of UBM comprising a wet etch process~~ 31, wherein the first layer, the second layer, and the third layer are flat ~~have flat top areas~~.

43. (currently amended) The structure of claim 30, ~~parameters of first and second dry film thickness in combination with parameters of said first layer of dry film as a mask and said second layer of dry film as a mask having been selected such that~~ wherein the diameter of the base of said torch bump is larger than the largest diameter of the solder ball of said torch bump which is larger than the diameter of the contact surface between the solder ball and the base of the torch bump flat bottom area.

44. (currently amended) The structure of claim ~~30~~, ~~parameters of first and second dry film thickness in combination with parameters of said first layer of dry film as a mask and said second layer of dry film as a mask having been selected such that~~ the diameter of the base of the torch bump is equal to the largest diameter of the solder ball which is larger than the diameter of the contact surface between the solder ball and the base of the torch bump 31, wherein the third layer is flat.

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45. (currently amended) The structure of claim ~~30~~, ~~parameters of first and second dry film thickness in combination with parameters of said first layer of dry film as a mask and said second layer of dry film as a mask having been selected such that the diameter of the base of the torch bump is smaller than the largest diameter of solder ball of the torch bump~~ 31 wherein the third layer is gold.